TECHNICAL AREA: VISUAL RESOURCES
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99. Please provide a plan similar to Figure 3.5-1A (i.e., with topographic elevation layer) that illustrates the footprints of the major enclosure structures and other major project components. Please provide this file in CAD form as well as hard copy form.

Response No. 99: Figure 3.5-1A illustrates the existing footprints with a topographic elevation layer. There will not be any enclosures around the Heat Recovery Steam Generators or exhaust stacks. It is possible that the method of rendering the Key Observation Points might have created an inference that there were enclosures on the major component and that these enclosures required modification to Figure 3.5-1a. In order to eliminate this confusion, and also in response to other data requests, the Key Observation Points have all been revised to simulate the infrastructure surrounding the equipment. Please refer to Attachment 1 for revised Key Observation Point analysis, and Attachment 2 for revised Key Observation Point renderings.

100. Please provide scaled east and west elevations of the proposed project similar to that information provided in Figure 3.4-3C for the north elevation. If the south elevation differs from the north elevation please provide the south elevation as well.

Response No. 100: The requested drawings are provided as attachments. Please refer to Attachment 3 for Figure 3.4-3D, *Plant General Arrangement View Looking East*, and Figure 3.4-3E, *Plant General Arrangement View Looking South*, and Figure 3.4-3F, *Plant General Arrangement View Looking West.*

101. Please provide a description in scaled plan form of opportunity sites for establishment of enhanced screening vegetation on or near all four boundaries of the project plant.

Response No. 101: The requested plan is provided as an attachment. Please refer to Attachment 4. A 10-foot wide landscaping opportunity exists on the northern property line, and on the southern property line from the northern border to the intake pipe. Additionally, there is a limited opportunity on the southern property line due to steep slope conditions and limited area.

102. Please provide a description in scaled plan form of constraints to establishment of screening vegetation on or near the power plant boundaries such as utilities, pipelines, etc.

Response No. 102: The requested plan is provided as an attachment. Please refer to Attachment 5. Landscape constraints exist along the eastern property line due to overhead transmission lines, the SCE Substation, generators, and steep slope conditions. On the western property line from the intake pipe to the southern property line, landscaping constraints are due to the existing fenceline and revetments, which will remain in place.

103. Please provide a scaled conceptual screening plan and architectural elevation views, including landscape and architectural elements as appropriate, that would contribute to substantial screening of the proposed plant from foreground views on Pacific Coast Highway (PCH) and adjacent beaches. Screening of the proposed plant from foreground locations on PCH, and of the proposed plant and associated tank farm in views from Dockweiler Beach to the north and northwest are of particular concern.

Response No. 103: Based on evaluation of ESPR's Visual Resources Impacts, no mitigation measures are required as ESPR will not have any significant unmitigated impacts to visual resources. This analysis is contained in the original AFC in the visual resources chapter as well as in the revised analysis of the Key Observation Points provided as Attachment 1. Data Response #101 and 102 provide Landscaping Opportunities and Constraints. In the spirit of community cooperation ESP II is working with the El Porto area residents to consider mutually agreeable project components that would satisfy the local community that ESPR not only has no significant impacts but actually provides overall enhancements to visual resources. In regards to the area along 45th Street, the Applicant is obtaining input from interested residents at a Noise and Visual Community Meeting on April 12th. A CEC Noise and Visual Workshop on April 18thwill also provide an informal forum to discuss potential enhancements. Attachment 6 provides a sample conceptual plans that was used at the Community meeting on April 12 to stimulate discussion and develop understanding.

104. Please provide a list of suitable tree and large shrub species that would, in the opinion of a qualified arborist familiar with local conditions, be the optimal choices for landscape screening on the project site per Data Request 6.

Response No. 104: After consultation with a terrestrial biologist and landscape architect familiar with the local area and El Segundo and Manhattan Beach Ordinances, there are no native species which would be optimal choices for screening. However, two non-native types were identified. The choices are Palm Trees and Myoporums, which both have an average height of 35 – 40 feet. The palm is hardy specie that has a high growth rate and is currently growing in areas surrounding the ESPR. Myoporum is an evergreen shrub, which can grow into small trees. This specie is ideal to its ability to take full sun, has a high growth rate, and is fire retardant.

105. Please provide additional architectural screening treatment concepts, such as architecturally-designed or modified enclosures or other feasible techniques, for the proposed HRSGs and exhaust stacks, that would

enhance their visual compatibility with the scenic coastal zone and reduce the industrial character of the more prominent structures.

Response No. 105: Because the use of enclosures to surround the Heat Recovery Steam Generator (HRSG) and stacks would substantially increase the mass and bulk of the structures, such enclosures are not acceptable to ESPR's goal to repower Units 1 and 2 of ESGS while staying in the existing environmental envelope of the facility. New KOP's are provided as well as new analysis. The new KOPS show increased piping and infrastructure detail. ESP II believes that this increased detail demonstrates a project that maintains the existing view shed character of the facility ensuring that there are no significant impacts to visual resources. Since mitigation is not needed, the addition of an enclosure, even if it did not add to the mass and bulk of the infrastructure would still not be a beneficial enhancement

106. Please provide simulations depicting the landscape and architectural screening concepts described above, from viewpoints described under Data Requests (12, 13), below. Landscaping should be depicted at an age of approximately 5 years after installation, and at maturity. Please provide five sets of 11' x 17" high quality color photocopies of the simulations that will reproduce a life-size viewing scale when viewed at a normal reading distance of approximately 18 inches.

Response No. 106: Based on evaluation of ESPR's Visual Resources Impacts, no mitigation measures are required as ESPR will not have any significant unmitigated impacts to visual resources. This analysis is contained in the original AFC in the visual resources chapter as well as in the revised analysis of the Key Observation Points provided as Attachment 1. In the spirit of community cooperation ESP II is working with the El Porto area residents to consider mutually agreeable project components that would satisfy the local community that ESPR into only has no significant impacts but actually provides overall enhancements to visual resources. Because no mitigation is required, no landscape and architectural screening concepts are required under the California Environmental Quality Act (CEQA) or the Warren-Alquist Act. ESP II understands and has stipulated to the standard CEC conditions for visual resources which include conditions ensuring that applicants complete approval by the local responsible permitting authority for landscaping as required by local ordinances. Under standard CEC visual resource conditions the plans for such landscaping are submitted pursuant to the compliance period schedule, substantially before such landscaping work is done.

107. In conjunction with the responses to Data Requests 5 and 7, please provide a proposal for a design development process involving the affected communities that would allow for community input into the design and encourage ultimate design consensus.

Response No. 107: As discussed in response to Data Requests 103 and 106 above, in the spirit of community cooperation, ESP II is working with the El Porto area residents to consider mutually agreeable project components that would satisfy the local community that ESPR not only has no significant impacts but actually provides overall enhancements to visual resources. Resident representatives of the El Porto neighborhood have been meeting with the Applicant since October 2000 to discuss the existing and future noise environment and the aesthetic treatment of the 45th Street property boundary. Details of those discussions were mentioned by the residents at CEC workshops.

An April 12, 2001 community meeting was arranged by ESP II. A notice of the meeting was sent by US Mail to residents and owners within a 1000-foot radius of the property line. The Applicant presented sample concepts for a 20-foot wall, made of acoustically absorbent material, and a landscaped buffer that would serve as a visual separation between the industrial and residential uses. The wall would effectively replace the decommissioned fuel tanks from a noise perspective and substantially enhance the aesthetics of the southern property line.

In addition to the one-on-one discussions and the presentation of noise data and visual solutions on April 12, the CEC has designated the April 18 workshop as having a visual/noise focus. Residents will have the opportunity to comment again on the information and design solutions that are being explored by the ESP II. ESP II looks forward to continuing and completing the cooperative process that ensures that ESPR process will reflect community input and values.

108. Please provide five sets of high quality color photocopies of a photo of the existing site and simulation of the proposed plant from PCH at an immediate foreground distance (approximately half the distance depicted in Figure 5.13-8b). The view locations and lens setting should be selected to be as near to the plant as possible while including all major visible proposed structures (e.g., top of stacks). The photocopies need to be at life-size scale when viewed at a normal reading distance (approximately 18 inches) with a minimum vertical image dimension of 9". Please specify the lens setting used. Please also provide three CDs of electronic copies of the images.

Response No. 108: The requested new KOP is provided. Please refer to Figure 5.13-11A, *Existing View From KOP 8* and Figure 5.13-11B, *Simulated View From KOP 8*. This viewpoint is approximately half the distance depicted in Figure 5.13-8B. This view was taken using a Fuji G-617 Panoramic Camera with a 1:8/105 mm lenses, shot at f-16, 30th sec shutter speed.

109. Please provide five sets of 11' x 17" high quality color photocopies of a photo of the existing site and a simulation of the proposed plant from Dockweiler Beach at an immediate foreground distance (within 200-300 feet) as described under Request 10, i.e., as near as feasible while

including all major visible structures. The photocopies need to be at life-size scale when viewed at a normal reading distance (approximately 18 inches) with a minimum vertical image dimension of 9". Please also provide three CDs of electronic copies of the images.

Response No. 109: The requested new KOP is provided Please refer to Figure 5.13-10A, *Existing View From KOP 7* and Figure 5.13-10B, *Simulated View From KOP 7*. This viewpoint was taken from the jetty immediately west of the proposed project site on Dockweiler Beach. This viewpoint was chosen to represent the best foreground view, while being able to include all of the major visible plant structures. The picture was taken using a Fuji G-617 Panoramic Camera with a 1:8/105 mm lenses, shot at f-16, 30th sec shutter speed.

110. Please provide the following information regarding the existing operating units' exhaust parameters and the proposed project exhaust parameters.

   a. Stack Exhaust Temperature;
   b. Moisture Content (% by Weight);
   c. Mass Flow (1000 lbs/hr), and;
   d. Average Molecular Weight (lbs/mole).

   The Applicant may provide these exhaust parameters, in tabular form, for the range of ambient conditions (i.e. ambient temperature and relative humidity) and load conditions that can be reasonably expected occur at the project site location; or if the Applicant desires they may provide a worst case exhaust condition that staff will model throughout the year. If a single worst-case condition is supplied the applicant will provide information to verify the worst-case assumptions of that condition.

   If for some reason the post project exhaust conditions for existing Units 3 and 4 will be different than existing conditions then please provide pre-project and post-project data for these stacks. All data provided should indicate units and be provided by stack name as appropriate for clarity.

Response No. 110: The results of the visible plume modeling analysis are summarized in Table 5.13-7 of the AFC. While the correct visible plume modeling results are shown in the AFC, the incorrect methodology for the analysis was inadvertently included in the visible plume modeling write-up (i.e., AFC Section 5.13.5.5). The following is a description of the visible plume modeling performed for the Project. As discussed below, the visible plume modeling was performed for the new equipment (i.e., gas turbines) and not the existing Units 3 and 4. As requested, the exhaust parameters for the existing Units 3 and 4 are also included below.

Overview – Visible Plume Analysis

The basic principle used to analyze the visible water droplet plumes for the ESPR Project involves modeling the dilution of a water vapor plume as a function of wind speed, distance, and stability class from the release point, similar to the Gaussian approach for modeling gaseous pollutants. As the plume is diluted, the temperature of the plume approaches ambient temperature, and the moisture content of the plume approaches the moisture content of the surrounding ambient air. At any given point along the plume, one can use the dilution factors to determine the plume temperature and moisture content, given knowledge of the temperature and moisture content of the plume at the time it leaves the release point, and of the temperature and moisture content of the ambient air. Knowing the temperature and moisture content of the plume at that point enables one to determine whether the moisture will condense at that point to form a visible water plume. By performing these calculations along a series of points, one can determine whether a visible plume will form and, if so, the length of the visible plume for each hour evaluated.

The modeling system includes the following components:

- A modified version of the Industrial Source Complex Short Term Model Version 3 (ISCST98356) is used to determine plume dilution through the evaluation of water droplet concentrations determined along a series of receptors placed along the plume centerline. These calculations are performed for each hour of the year using a standard modeling meteorological data set.
- A second module, CLAUSIUS, determines the amount of dilution of the plume that is required for the visible plume to evaporate.
- A third module, DISTANCE, determines the distance (along the plume centerline) that the plume is visible.
- A fourth module, COUNT, summarizes the statistics and prints a report.

Each of these components is discussed in more detail below.

Modified ISCST3

ISCST3 was modified to provide for the determination of pollutant concentrations along the centerline of a plume. The centerline of the plume is represented by flagpole receptors along a single radial from the stack. The model produces an output file, which includes concentrations for each receptor along the radial for each hour of the year. Relative to the concentration present in the stack, the concentrations reported at each receptor represent the degree of dilution of the plume with ambient air at that point. The modified version of ISCST3 has the following features:

- Calculations can be performed for up to 100 receptors placed along the centerline of the plume.
- Default ISCST3 features that prevent calculations of pollutant concentrations at locations close to the emission source have been disabled.
- To avoid ignoring meteorological conditions where visible plumes are likely to be formed, wind speeds of less than 1.0 m/s are set to a wind speed of 1.0 m/s, to avoid implementing the calms processing feature of ISCST3.
- Concentrations are calculated regardless of whether the plume height lies above or below the mixing height.
- Calculations are performed for only simple terrain.
- Calculations are performed for only a single source.

Meteorological data from Lennox for the 1981 calendar year, obtained from the South Coast Air Quality Management District (SCAQMD), were used for the plume visibility analysis. Sounding data, which are included in the SCAQMD data set, are from the Los Angeles Airport. Relative humidity data from the Los Angeles Airport (i.e., 1981) was used for the analysis.

<u>CLAUSIUS</u>

The CLAUSIUS module uses a linear interpolation of water vapor pressure, between the stack exit and ambient conditions, together with the Goff-Gratch formulation of the Clausius-Clapeyron equation for water vapor, to determine the amount of dilution required for the visible plume to not be visible. These calculations are performed for each hour of the year, using the same meteorological data set used for the ISCST3 dispersion modeling analysis. The CLAUSIUS program can perform calculations for various types of sources:

- Sources with a fixed exit temperature
- Sources with exit temperatures at a constant increment above ambient temperatures
- Sources with a fixed moisture content
- Sources where moisture content is a function of ambient temperature
- Sources with a moisture content fixed at a specified relative humidity, given an ambient temperature
- Sources with diurnal cycles of temperature and water content

In this regard, the modeling system can be somewhat more versatile than other models typically used to evaluate visible water plumes, such as SACTIP (Seasonal/Annual Cooling Tower Impact Program), since combustion sources as well as cooling towers can be treated.

DISTANCE

The DISTANCE module uses the resulting output from ISCST3 and CLAUSIUS to determine the distance along the centerline of the plume where sufficient dilution has occurred such that the plume is no longer visible.

COUNT

The COUNT module summarizes and prints the statistics regarding plume visibility. Available statistical outputs include the number and frequency of hours in which a plume is visible, separately for daytime and nighttime conditions, as well as a frequency distribution of visible plume lengths. The day/night boundary is treated as sunrise/sunset, calculated for every day of the year.

Assumptions

The following exhaust characteristics were derived from data provided by the project's design engineering firm, and reflect worst-case conditions. (Low ambient temperatures, often accompanied by high relative humidity are most likely to be associated with the formation of a visible water plume; turbine fuel consumption is highest at low ambient temperatures.) Please note that for the gas turbine/HRSG full load operation case the high moisture content of 15.53% by volume is due to the use of steam power augmentation and a 600 MMBtu/hr duct burner. Typical exhaust moisture contents for gas turbines without power augmentation and large duct burners range from 7% to 9% by volume.

Table 2 Exhaust Characteristics For New Equipment ESPR Project	
HRSG Stack (full load operation) With Duct Burner and Power Augmentation	
Stack gas exit temperature	442.39 deg. K
Stack diameter	5.791 m
Stack gas exit velocity	24.04 m/s
Stack gas moisture content	15.53% vol.
Stack gas mass flow	3,819,342 lbs/hr
Stack gas average molecular weight	27.61 lbs/lb-mol (wet)
HRSG Stack (full load operation) Without Duct Burner and Power Augmentation	
Stack gas exit temperature	368.56 deg. K
Stack diameter	5.791 m
Stack gas exit velocity	19.90 m/s
Stack gas moisture content	8.00% to 9.01%vol. (extrapolated each hour depending on ambient temperature)
Stack gas mass flow	3,895,776 lbs/hr
Stack gas average molecular weight	28.35 lbs/lb-mol (wet)
HRSG Stack (50% load operation) Without Duct Burner and Power Augmentation	
Stack gas exit temperature	352.78 deg. K
Stack diameter	5.791 m
Stack gas exit velocity	12.08 m/s
Stack gas moisture content	7.79% to 8.55%vol. (extrapolated each hour depending on ambient temperature)
Stack gas mass flow	2,462,156 lbs/hr
Stack gas average molecular weight	28.26 lbs/lb-mol (wet)

Interpretation of Results

The water droplet plume visibility analysis is an approximation technique, which should not be used to establish limiting conditions for the operation of a facility or a particular piece of equipment. The following caveats should be observed in interpreting the model results:

- Meteorological conditions reflecting low mixing heights may not necessarily be properly modeled. Little data are available regarding temperatures and relative humidity levels above the mixing height at any particular location, such as Indio, and the plume is no longer in a well-mixed surface layer.

- The model is least reliable at predicting plume visibility under calm nighttime conditions, since both temperature and relative humidity vary strongly with height under those conditions. What is measured at the meteorological station (at a height of 10 meters) may vary considerably from actual conditions at plume height. In general, under cold, nighttime conditions (with shallow radiation inversions), temperatures are likely to be colder, and relative humidity higher, at the height of the meteorological monitor than at plume height, thus resulting in an overstatement of plume visibility during these conditions.

- Latent heat release and absorption are not treated in the modeling system. These effects are likely to be of secondary importance for combustion plumes traveling for relatively short distances, but may play a more important role for cooling tower plumes. Condensation of water droplets in the plume will cause the plume to increase in temperature, while evaporation of those droplets will subsequently cool the plume by a similar amount. These effects are likely to be negligible in the case of combustion sources, where the plume temperature is already 100°F (or more) warmer than the surrounding ambient air. The effect of ignoring latent heat release and absorption is to slightly underestimate initial plume rise, and slightly underestimate plume length.

- The model results are extremely sensitive to assumptions regarding ambient and stack gas moisture content and relative humidity (as is actual plume visibility). Furthermore, it is not clear that the accuracy of the relative humidity monitors is suitable for the use to which the data are being applied.

- The modeling system does not have the capacity of distinguishing foggy hours from other hours. Since the identification of foggy hours is frequently absent from the meteorological databases commonly used for modeling, the capacity to identify foggy hours has not been incorporated into the modeling system.

Modeling Results

The following table summarizes the hour-by-hour modeling results.

Table 3
Visible Plume Modeling Results
ESPR Project

	Full Load With Duct Burner and Power Augmentation	Full Load Without Duct Burner and Power Augmentation	50% Load Without Duct Burner and Power Augmentation
Total number of hours with visible plume	5	3	19
Number of Daylight Hours with visible plume	2	1	4
Number of Nighttime Hours with visible plume	3	2	15
Maximum Plume Height (meters)	*	*	162
Average Plume Height (meters)	*	*	8
Maximum Plume Diameter (meters)	41-83**	41-83**	53
Average Plume Diameter (meters)	24-35**	24-35**	3

Notes:
* Meteorological conditions result in a theoretical unlimited plume height.
** Range of nominal plume diameters for a similar project.

<u>Stack Parameters for Existing Units 3 and 4</u>

The following are the exhaust parameters for the existing Units 3 and 4.

Table 4 Exhaust Characteristics For Existing Units 3 and 4 ESPR Project	
Stack gas exit temperature	390.78 deg. K
Stack diameter	6.452 m
Stack gas exit velocity	15.39 m/s
Stack gas moisture content	15.55 % vol.
Stack gas mass flow rate	3,071,202 lbs/hr
Stack gas average molecular weight	29.62 lb/lb-mol (dry)

111. Please provide hourly meteorological data files from a meteorological monitoring station located near the project site that includes, at a minimum, the following parameters:

  e. Year, Month, Day, Hour
  f. Ambient Temperature and Relative Humidity
  g. Wind Speed and Wind Direction (from Direction)
  h. Stability Class

A minimum of five sequential years should be provided. Additional meteorological parameters, such as fog or other visibility obscuring phenomena (i.e. rain, haze), should be provided if available (as is found in HUSWO data). Please provide the meteorological data files in an ASCII space delimited, or spreadsheet, form for ease of use. Also, please provide the name and location (in UTM or other standard coordinate system) of the meteorological data station. The Applicant should also provide a copy of the meteorological data that they used in their initial modeling assessment if different from the meteorological data provided to meet the requirements of this data request.

Staff currently has a six-year (1990 through 1995) data set from a Long Beach monitoring station that can be used if the applicant considers Long Beach data to be reasonably representative of the site in El Segundo, or if no better data source is available. However, staff believes that appropriate meteorological data is likely to be available from meteorological station(s) located at LAX.

Please provide any available information regarding prior complaints about the existing exhaust stack visual plumes that have been received by the Applicant, the City of El Segundo, or SCAQMD.

Response No. 111: As discussed in the response to Data Request 110, the visible plume analysis for the ESPR project was performed using meteorological data from Lennox for the 1981 calendar year, obtained from the South Coast Air Quality Management District (SCAQMD). Sounding data, which are included in the SCAQMD data set, are from Los Angeles Airport. Mixing ratio data were derived from 1981 Los Angeles Airport surface temperature and relative humidity data. The 1981 Lennox meteorological data was submitted to the CEC in electronic format as part of the AFC. The 1981 Los Angeles Airport hourly relative humidity data are enclosed in electronic format on a compact disk.